

Forest Health Protection



Report 04-6

March 2004

2003 NORTH IDAHO DOUGLAS-FIR TUSSOCK MOTH TRAPPING SYSTEM REPORT

Sandra Kegley, David Beckman, and Doug Wulff

Introduction

The Douglas-fir tussock moth Early Warning System in north Idaho is a cooperative effort between Forest Service (FS) and Idaho Department of Lands (IDL). This system uses a series of permanent pheromone trapping sites to identify increasing populations of tussock moth prior to an outbreak and tree defoliation (Daterman et al. 1979). IDL maintains Douglas-fir tussock moth trap sites from Coeur d'Alene to Moscow; the Northern Region of the FS maintains trap sites from Lewiston east and south to the Salmon River.

A pheromone trap site consists of five sticky traps baited with the Douglas-fir tussock moth attractant pheromone. Male moths are attracted to and caught in the traps. An average of 25 male moths per site is used as a threshold to alert managers to rising tussock moth populations. Additional population measurements, such as larval or egg mass sampling, is then conducted in areas of concern surrounding the trap site to determine the status of the population.

2003 Trapping Results

On 122 sites trapped by IDL, the average trap catch was 0.2 moths per trap, down from 31.3 moths per trap in 2002 (IDL unpublished data, appendix 1). There were no sites with an average of 25 moths per trap.

The site with the highest number of moths caught was Flynn Butte with an average of 3.2 moths per trap.

On 27 sites south of Lewiston monitored by the FS, average trap catch was 0.1, down from an average of one moth per site in 2002 (appendix 2). On six new sites established in 2002 in the outbreak area near Potlatch, average trap catch was 1.3, down from an average of 32.9 in 2002. The site with the highest number of moths caught was Elk Creek Falls with an average of 4.8 per trap.

Defoliation

There was no aerially visible defoliation due to Douglas-fir tussock moth detected in 2003 in north Idaho. The outbreak that caused defoliation from 2000-2002 now appears to be over (figure 1).

This most recent outbreak in north Idaho resulted in 3 years of defoliation on the Clearwater National Forest and adjacent state and private land between Moscow and Plummer. Douglas-fir tussock moth outbreaks have occurred in this same general area about every 10 years since the 1940's (Randall 2002, Tunnock 1973). An outbreak prior to the most recent outbreak occurred with defoliation during only 1 year—1986. Both outbreaks were preceded by increasing numbers of moths caught in traps (fig. 1)



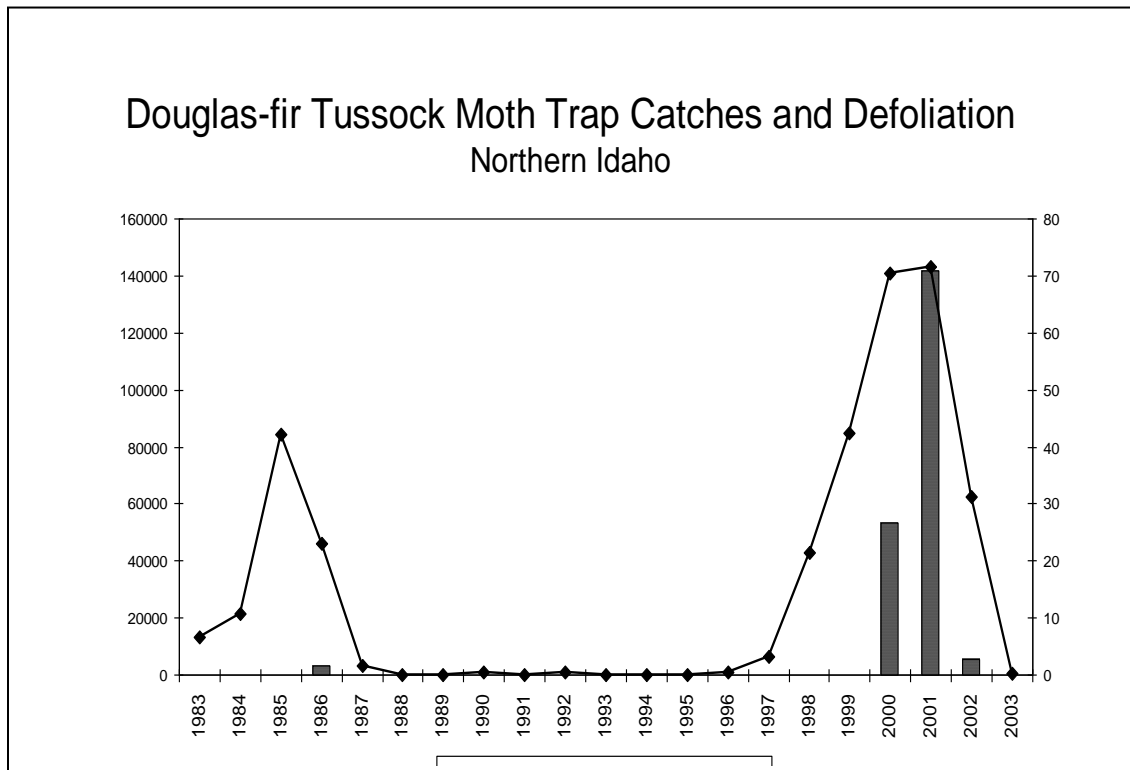


Figure 1. Average trap catches by IDL north of Moscow and aerially detected defoliation for the last two Douglas-fir tussock moth outbreaks.

Conclusions

The early warning Douglas-fir tussock moth trapping system is effective in predicting outbreaks. The two latest outbreaks were preceded by 3 years of increasing trap catches. However, intensity of the outbreaks could not be predicted by trapping alone. Trap catches preceding defoliation in 1986 were about the same as those preceding defoliation in 2000. But intensity of the two outbreaks was very different. This confirms the need for additional population sampling to help determine the trends of outbreaks (Mason and Torgersen 1983).

Trapping for Douglas-fir tussock moth will continue annually but we expect trap catches to remain very low for the next several years.

Literature Cited

- Daterman, G.E., R.L. Livingston, J.M. Wenz, and L.L. Sower. 1979. How to Use Pheromone Traps to Determine Outbreak Potential. USDA Agriculture Handbook No. 546. 11 p.
- Mason, R.R. and T.R. Torgersen. 1983. How to Predict Population Trends. USDA Agriculture Handbook No. 610. 7 p.
- Randall, C. 2002. Douglas-fir tussock moth biological evaluation Palouse Ranger District, Clearwater National Forest-2001. USDA Forest Service, Northern Region, Forest Health Protection Rpt. 02-5. 33 p.
- Tunnock, S. 1973. The Douglas-fir tussock moth in the Northern Region—a cartographic history of outbreaks from 1928 to 1973. USDA For. Serv., Northern Region Rpt. 73-27.

Appendix 1. Average trap catch for IDL monitored sites from Coeur d'Alene to Moscow for the past 6 years.

Plot #	AREA	2003	2002	2001	2000	1999	1998	1997
1	Elk Mountain	*	*	*	13.8	0.6	0.2	0.0
2	Coeur d'Alene Mountain	*	*	*	8.4	0.2	0.6	0.2
3	Lolo Pass	0	8.2	110.2	91.8	16.2	1.0	0.2
4	Charles Butte	0.2	28.2	84.8	73.6	*	0.0	0.0
5	Peterson Point	0.2	15.8	101.0	56.4	1.0	1.0	0.0
6	East Dennis	1.2	75	101.2	81.2	3.0	1.2	0.0
7	East Gold Hill	0.2	14.8	53.8	83.6	27.2	6.0	0.0
8	Flat Creek	0	7.6	88.0	87.6	65.8	39.2	7.8
9	Long Creek	0.2	33.6	0.2	105.4	82.0	71.4	35.0
10	Paradise Point	0	17	91.8	81.2	59.4	31.4	1.8
11	Mineral Mountain	1.8	75.2	56.4	73.4	66.6	50.8	3.4
12	Mission Mountain	0.2	25.6	1.6	65.6	52.4	32.2	4.2
13	Spring Valley Creek	0	5.4	58.0	61.2	44.8	25.6	1.4
14	Vassar Meadows	0	95.8	102.8	83.2	16.4	2.0	0.0
15	Fairview Knob	0.2	39	105.8	33.2	4.4	2.8	0.0
21	West Twin (10-115)	0	8.8	75.4	*	37.6	20.2	0.4
22	Moscow Mtn (115-114)	0.2	5.8	78.0	90.8	53.4		
101	S Fk Little Plummer Ck	2.8	52.2	92.4	70.0	15.4	0.0	0.0
102	Windfall Pass	0.6	40.4	99.6	74.2	12.4	11.4	0.0
103	Squaw Creek	0.2	9.4	89.2	55.2	5.4	4.0	0.0
104	Moses Mountain	0.2	6.4	67.8	19.0	2.2	4.2	0.0
105	Little John Creek	1.4	45	78.4	54.8	1.2	0.2	0.0
106	Emida Peak	*	64.2	75.8	71.0	*	0.0	0.0
107	North-South Ski Area	0.6	83.2	107.2	73.6	4.4	0.2	0.0
108	Bald Mountain	0	25.2	53.8	5.2	*	*	0.0
109	Laird Park	1.0	66	86.0	74.8	6.0	0.0	0.0
110	North Fork Palouse River	1.0	83.2	75.2	24.8	*	0.0	0.0
111	Mica Mountain	0.2	67.6	93.6	81.0	9.0	1.8	0.2
112	Schwartz Creek	0.2	80.6	110.6	89.0	14.2	2.0	0.8
113	Big Bear Creek	0.2	47.8	87.0	71.4	75.6	23.6	8.4
114	Big Meadow Creek	0	11.2	70.2	108.6	63.8	33.2	4.2
115	East Twin Mountain	0	7.6	85.4	87.4	55.8	52.4	1.8
116	Crane Point	0	51	89.0	63.2	5.1	3.2	1.2
117	Sheep Creek	0	27.8	83.2	79.2	53.6	59.6	3.2
118	West Fork Mission Creek	0	22.2	47.6	37.0	35.8	42.2	1.6
119	1 Mi N. of Mineral Mtn (11-216)	0	25.2	0.2	82.8	52.6		
200	2 mi W of Plummer	0	16.2	80.2	25.0	0.0	0.0	0.0
201	Coon Creek	0.2	21.6	93.8	50.8	3.4	0.8	0.0

Appendix 1. Continued

Plot #	AREA	2003	2002	2001	2000	1999	1998	1997
202	3 mi E of Benewah	0.6	21	102.2	*	*	0.0	0.0
203	Benewah Point	0	8.2	92.4	53.0	4.6	0.0	0.0
204	John's Point	0	23.8	*	*	*	0.0	0.0
205	3 mi E of Charles Butte	0.4	63.6	72.6	64.8	12.6	0.0	0.0
206	Sunset Mountain	0	20.8	*	*	*	*	*
207	Emerald Butte	0	23.2	*	*	*	*	*
208	Cedar Butte	0	22.4	76.2	*	*	*	*
209	Abes Knob	0	23.8	88.4	*	*	*	*
210	West Fork Deep Creek	0.2	77	90.6	91.2	74.2	20.0	0.8
211	Cherry Butte	0.4	67.2	88.6	50.6	*	0.0	0.0
212	Jackson Mountain	0	19.6	*	*	*	*	*
213	Red Horse Mountain	*	*	*	3.2	0.4	0.2	0.0
214	Fortier Creek	*	*	*	2.4	0.6	0.2	0.0
215	Killarney Mountain	*	*	*	4.4	1.2	0.4	0.2
216	1 mi NW of Mineral Mtn	0.2	1	0.2	93.0	36.4	29.8	1.4
217	Head of Sheep Creek (216-117-2)	0.6	21.2	97.2	101.8	66.2	62.8	5.4
300	Mission Mountain (#2)	0.6	6.4	67.0	71.2	16.0	56.8	2.2
301	1.5 mi S of Mineral Mtn	0.2	69.4	91.2	107.6	72.2	52.8	3.2
302	Middle Fork of Deep Creek 1 (301-216-1)	0	63.8	3.6	89.8	62.2	51	
303	Middle Fork of Deep Creek 2 (301-216-3)	1.0	58	15.8	99.6	72.8	42.4	1.8
400	3 mi S of Mineral Mtn	0.6	75.8	86.6	108.6	92.6	47.0	2.6
401	Flynn Butte	3.2	95.2	96.4	67.8	9.2	1.0	0.0
402	2 mi SE of Browns Mdw	0	15.2	57.4	112.0	65	41.2	4.0
500	3 mi SW of Harvard	0	18.8	74.6	111.0	78.8	59.2	59.4
501	2 mi S of Moon Hill	0	16.2	97.6	70.0	72.8	44.4	3.8
502	3 mi W of Crane Point	0.6	67.6	75.0				
503	3 mi N of Stanford Point	0	10.2	89.4	84.0	73.2	0.0	0.0
504	2 mi N of Stanford Point	0.2	47.8	86.2	75.8	52.2	0.0	0.0
505	1 mi SW of Stanford Point	0	38.4	47.0	88.0	90	48.4	4.4
506	1 mi S of Stanford Point	0	23.4	67.8	70.6	89.4	38.8	4.0
507	1 mi NE of Stanford Point	0.8	40.6	87.4	97.4	77.8	23.8	3.4
508	1 mi W of Stanford Point	0	20.6	92.4	95.2	97.8	49.4	7.2
509	2 mi NW of Stanford Point	0.4	43.2	81.6	95.6	75.8	46.0	10.8
510	Moon Hill	0.8	35	67.2	66.2	71.4	42.6	4.2
511	2 mi SE of Moon Hill	0.2	13.2	80.4	72.6			
512	3 mi S of Mineral Mtn	0.2	70.2	*	*	*	*	0.0
513	2 mi SW of Moon Hill	0	9.6	9.2	75.8	44	8.0	4.8
514	1.5 mi NW of Avon	0	6.8	61.4	68.6	13.0	0.0	0.0
601	1 mi NW of Elk Mtn	*	*	*	8.4	0.4	0.0	0.0
602	Pleasant Creek	*	*	*	0.4	0.0	0.0	0.0
603	West Fork Fortier Creek	*	*	*	3.2	0.8	0.2	0.0
604	Elk Mountain	*	*	*	15.4	0.8	0.2	0.0
605	Rose Creek	*	*	*	8.2	0.4	0.0	0.0

Appendix 1. Continued

Plot #	AREA	2003	2002	2001	2000	1999	1998	1997
701	Fourmile Creek	0	9	88.6	46.4	*	*	*
702	North of Granite Point	0	5.8	76.0	81.6	*	*	*
703	Spring Valley Creek	0	12.2	96.6	92.4	*	*	*
704	West Fork Big Bear Creek	0.2	13.2	61.0	41.4	*	*	*
705	2 Mi NW of Stanford PT	0.4	46.4	89.4	84.6	*	*	*
706	1 Mi S. of Iron Mtn	0	27.2	87.8	22.2	*	*	*
707	Iron Mtn	0	6.6	97.0	23.0	*	*	*
708	Little Bear Creek	0	65.6	108.6	*	*	*	*
709	Quartz Creek	0	50.4	96.2	*	*	*	*
710	Turnbow Creek	0.2	43	70.6	*	*	*	*
711	East Fork Flat Creek	0.2	55	71.4	85.8	*	*	*
712	Turnbow Point	0.2	7.8	38.0	79.4	*	*	*
713	3 Mi S. of Pottlatch	0	6.6	30.0	4.2	*	*	*
714	Rocky Point	0	13.2	79.6	40.2	*	*	*
715	Hatter Creek	0.2	7.4	32.0	22.4	*	*	*
716	Head of Big Meadow Creek	0	11.8	80.8	82.4	*	*	*
717	Nora Creek	0	21.2	81.4	58.4	*	*	*
718	Crummaring Creek	0	12.4	70.4	68.8	*	*	*
719	Basalt Hill	0	19	11.6	92.8	*	*	*
720	Browns Meadow	0.2	11.2	2.6	97.6	*	*	*
721	Smith Creek	0	100.2	70.6	*	*	*	*
722	Prospect Peak	0	31.2	56.8	85.6	*	*	*
723	West Fork Mission Creek	0	27.8	22.2	87.4	*	*	*
724	Huckleberry Mtn	0	16.6	77.2	43.4	*	*	*
725	North Fork Pine Creek	0	21.6	93.0	15.0	*	*	*
726	Mineral Creek	0	20.2	78.0	76.2	*	*	*
727	South of Sanders	0	77.8	86.8	32.4	*	*	*
800	Mason Butte	0	20.8	63.0	*	*	*	*
801	Moctileme Butte	0	30.2	91.4	*	*	*	*
802	Plummer Butte	0	24.8	75.2	*	*	*	*
803	Little Plummer Creek	0	18	54.4	*	*	*	*
804	Lindstrom Peak	0	21.2	66.4	*	*	*	*
805	John Point	0	20.4	61.6	*	*	*	*
806	Pettis Point	0	22.6	71.2	*	*	*	*
807	Beaver Mtn	0	17.8	55.6	*	*	*	*
808	Renfro Peak	0	14.8	44.2	*	*	*	*
809	Crystal Peak	0	10.4	29.4	*	*	*	*
810	Head of Child Creek	0	17.2	52.8	*	*	*	*
811	Hobo Pass	0	7.8	25.4	*	*	*	*
812	Hemlock Butte	0	9.2	28.2	*	*	*	*
813	Carpenter Peak	0	18.8	57.8	*	*	*	*
814	Tyson Creek	0	30.2	87.6	*	*	*	*
815	Willow Peak	0	25.2	85.2	*	*	*	*
816	Sunset Mtn	0	31	86.2	*	*	*	*

Appendix 1. Continued

Plot #	AREA	2003	2002	2001	2000	1999	1998	1997
817	Willow Creek	0	22.2	73.2	*	*	*	*
818	Head of Emerald Creek	0	28.2	86.0	*	*	*	*
819	Emerald Butte	0	25	75.2	*	*	*	*
820	Head of Bobs Creek	0	25.4	79.0	*	*	*	*
821	East Fork of Potlatch River	0	25.2	67.2	*	*	*	*
822	Head of Moose Creek	0	24.8	69.6	*	*	*	*
823	Beals Butte	0	39	106.2	*	*	*	*
	* not trapped							
	Total Average	0.2	31.3	71.5	70.4	43.5	22.1	3.3

Appendix 2. Average trap catch for FS monitored sites south of Lewiston for the past 11 years, and 6 sites trapped in 2002 and 2003 near Potlatch.

Plot ID	Site Name	Site #	2003	2002	2001	2000	1999	1998	1997	1996	1995	1994	1993
1	Keuterville	3-1	0	0.0	2.2	0.0	1.6	0.6	0.0	0.0	0.0	0.0	0.0
2	Johnson	5-1	0	4.8	4.0	0.2	3.0	1.2	0.0	0.0	0.0	0.0	0.0
3	Summit Landing	5-6	0.2	0.0	14.6	0.4	0.8	0.2	0.0	0.0	0.0	0.0	0.2
4	Cottonwood Butte	3-2	0	0.0	2.8	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
5	Shin Pt	5-7	0	1.3	13.2	0.2	3.6	5.6	0.0	0.0	0.0	0.0	0.0
6	Cooper	5-10	0	0.2	3.8	2.2	1.4	0.8	0.0	0.0	0.0	0.0	0.2
7	Lake Waha	4-1	0	0.0	10.2	0.0	0.8	1.4	0.0	0.0	0.0	0.0	0.0
8	Skull Cr	5-9				5.2	2.2	2.0	0.0	0.0	0.0	0.0	0.0
9	Canyon Junction	6-1	0	0.8	11.2		0.0		0.0	0.0	0.0	0.0	0.2
10	Forest	4-6				0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.2
11	Swanson Cr	5-8	1.4	0.0	17.5	0.0	1.4	0.8	0.0	0.0	0.0	0.0	0.0
12	Fan saddle	6-2	0	0.2	0.6	1.0	0.4	0.4	0.0	0.2	0.0	0.0	0.0
13	Webb Cr	4-5	0	0.0	1.4	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0
14	Angel Butte	5-2	0.4	0.8	5.8	0.2	2.2	2.2	0.0	0.0	0.0	0.0	0.0
15	Lodge Pt	1-1	0.2	1.2	1.6	0.4	4.6	3.2	0.0	0.0	0.0	0.0	0.2
16	Black Pine	4-2		0.2	18.2	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
17	Bald Mtn	5-5	0.2	9.0	36.0	0.0	3.2	0.4	0.0	0.0	0.0	0.0	0.2
18	Big Tinker	1-5	0	0.6	1.4	1.6	2.5	0.2	0.0	0.0	0.0	0.0	0.0
19	Junction	4-3	0	0.0		0.0	0.2	0.8	0.0	0.0	0.0	0.0	0.0
20	Bargamin Cr	5-4	0	4.8	35.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
21	Potatoe Hill	1-4	0	0.2	0.2	3.0	1.8	1.4	0.0	0.0	0.0	0.0	0.0
22	Captain John	4-4	0	0.2	3.6	0.0		0.8	0.0	0.0	0.0	0.0	0.2
23	Grangemont	5-3	0.4	2.2	16.2	0.0	1.2	0.6	0.0	0.0	0.0	0.0	0.0
24	Pine Knob	1-3	0	1.0	4.8	0.0	2.8	3.4	0.0	0.0	0.0	0.0	0.0
25	Christie Cr	2-2	0	0.0	8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
26	S. Cow Cr	2-5	0	0.0	1.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
27	Cow Cr Saddle	2-3	0	0.2	0.2	0.0		0.2	0.0	0.0	0.0	0.0	0.0
28	Rhett Cr	2-1	0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
29	Low Saddle	2-4	0	0.0	0.4	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0
30	Goddard	1-2				0.0	0.4	0.2	0.0	0.0	0.0	0.0	0.0
31	Wickiup B					0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0
32	Craigmont					0.0	1.8	1.8	0.0	0.0	0.0	0.0	0.2
	Total Average of sites south of Lewiston		0.1	1.0	8.3	0.5	1.3	0.9	0	.01	0	0	0.1
33	Laird Park	7-1	0	52.2									
34	Little Bald Mtn.	7-2	0.2	22.0									
35	Little Boulder Cr.	7-3	0.4	40.4									
36	W.Fork Potlatch R.	7-4	2.4	40.4									
37	Elk Creek Falls	7-5	4.8	15.8									
38	Morris Creek	7-6	0.2	26.5									
	Total Average of sites near Potlatch		1.3	32.9									